

METHOD AND APPARATUS FOR MONITORING USERS OF A COMMUNICATIONS SYSTEM

FIELD OF THE INVENTION

This invention relates in general to the monitoring of users in communications systems and, in particular, to the centralized administration and control of the monitoring function within the communications systems.

BACKGROUND OF THE INVENTION

Many communications systems have the ability to provide intercept services. Intercept services are services for intercepting calls and providing an eavesdropping capability. These services are lawfully used mainly by law enforcement agencies (LEA) within their jurisdictions.

In prior art communications systems, intercept lists are maintained within switches, so that calls to be intercepted can be routed by the switches to the appropriate intercepting party, usually a LEA. When a call is placed, the switch consults the intercept list and, if the list designates the call as one to be intercepted, the switch routes the call to the intercepting party for eavesdropping. This works well as long as the juridical boundaries of LEAs and the service areas of communications systems coincide. This does not work as well when the juridical boundaries of LEAs do not coincide with the service area of communications systems. For example, if two communications systems are within the juridical boundaries of an LEA, and a user to be intercepted leaves the service area of the first system and enters the service area of the second system, it is necessary for the intercepting LEA to have that user added to the intercept list of the second system. As users become more mobile, and as the demand for intercept services grows, the problem becomes more acute.

In order for LEAs to track users to be intercepted through multiple communications systems, LEAs must contact service providers of those systems to have the users' information entered in the appropriate intercept list. It would be desirable to have a method and apparatus for dynamically updating intercept lists contained in switches so that LEAs would not have the burden of manually attending to the problem.

Satellite communications systems are revolutionizing the communications industry, and are exacerbating the already acute problems of maintaining intercept lists. People are now able to communicate with anyone, anytime, anywhere on the planet. This causes problems for the LEAs to control the lawful interception of calls. The service areas of the communications system are no longer fixed, and so it is not possible to determine a priori whether a user is within the juridical boundaries of the LEA based on which communications system is being accessed. The prior art methods and systems rely on the fact that if a user is using a given communications system, he is within the juridical boundaries of the LEA, and the call is automatically intercepted. With satellite based systems, the fact that a user is using the system does not show that he is within the juridical boundaries of the LEA. In fact, the user could be within one of many different LEA jurisdictions, and potentially, anywhere on the earth. It would be advantageous to have a method and apparatus for location based intercept. That is, it would be advantageous to have a system that would make intercept decisions based on user location information.

What is needed is a method and apparatus for centralized management and administration of intercept lists in a com-

munications system. What is also needed is a method and apparatus for location based intercept in a communications system.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a diagram of multiple LEA jurisdictions and multiple mobile communications systems in accordance with a preferred embodiment of the present invention;

FIG. 2 shows a diagram of multiple LEA jurisdictions and a satellite communications system in accordance with a preferred embodiment of the present invention;

FIG. 3 shows a diagram of a monitoring location register and switches in accordance with a preferred embodiment of the present invention;

FIG. 4 shows a diagram a monitoring location register and switches in accordance with a preferred embodiment of the present invention;

FIG. 5 shows a diagram of a monitoring location register in accordance with a preferred embodiment of the present invention;

FIG. 6 shows a flow chart for a method of monitoring a user in a communications system in accordance with a preferred embodiment of the present invention; and

FIG. 7 shows a flow chart for a method of maintaining an intercept list in accordance with a preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE DRAWINGS

Turning now to the drawings in which like reference characters indicate corresponding elements throughout the several views, attention is first directed to FIG. 1.

FIG. 1 shows a diagram of multiple LEA jurisdictions and multiple mobile communications systems in accordance with a preferred embodiment of the present invention.

Jurisdiction 12 and jurisdiction 18 are law enforcement agency jurisdictions with common geographical boundary 16. Jurisdiction 12 and jurisdiction 18 can be two adjacent local jurisdictions, such as counties or cities, or can be two adjacent countries, such as exist in Europe and Asia. Within jurisdiction 12 is communications system 20 and a portion of communications system 40. Within jurisdiction 18 is communications system 30 and a portion of communications systems 40. Shown within communications system 20 is subscriber 22, switch 24, terminal 26, and link 28. Shown within communications system 30 is switch 34, terminal 36, and link 38. Shown within communications system 40 is subscriber 42, switch 44, terminal 46, link 48, and switch 50. Communications systems 20, 30, and 40 can be either wireless or wireline systems.

Within communications system 20, terminal 26 functions as a user interface for the service provider to control switch 24. Terminal 26 can be a computer and is usually an integral part of switch 24. Terminal 26 is shown separate from switch 24 in FIG. 1 for ease of explanation. When subscriber 22 wishes to make a call, he accesses communications system 20 by contacting switch 24. Switch 24 then routes the call through communications system 20. If subscriber 22 is supposed to be monitored by LEA A in jurisdiction 12, then it is the responsibility of switch 24 to recognize this, intercept the call, and route it to the LEA.

In order for switch 24 to perform this function, it needs information regarding subscribers to be monitored, and how to route the monitored call. In a first embodiment of the invention, terminal 26 maintains a list of all subscribers to